IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S):	COLE , Laurence A.
SERIAL NO.:	10/616,323
FILED:	July 9, 2003
FOR:	Hyperglycosylated hGC (Invasive Trophoblast Antigen) in Differential Diagnosis of Malignant or Invasive Trophoblastic Disease
GROUP ART UNIT:	1642
EXAMINER:	Peter J. Reddig

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 223313-1450

TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

S I R:

Enclosed please find a copy of an International Preliminary Examination Report from the corresponding PCT case.

Respectfully submitted,

Coleman Sudol Sapone, P.C.

By:
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Dated: June 23, 2006

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: "Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" on June 23, 2006.

Harold Hull

Harold Hull

N12-003US

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
HENRY D. COLEMAN
COLEMAN SUDOL SAPONE, P.C.
714 COLORADO AVENUE
BRIDGEPORT, CT 06605-1601

PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of Mailing *(day/month/year)*	21 JUN 2006
Applicant's or agent's file reference NI2-003PCT	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US03/21306	09 July 2003 (09.07.2003)	10 October 2002 (10.10.2002)

Applicant

SCIENCE & TECHNOLOGY CORPORATION @ UNM

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US	Authorized officer
Mail Stop PCT, Attn: IPEA/ US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	MINH TAM DAVIS Telephone No. 571-272-1600

Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference NI2-003PCT	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/US03/21306	International filing date *(day/month/year)* 09 July 2003 (09.07.2003)	Priority date *(day/month/year)* 10 October 2002 (10.10.2002)
International Patent Classification (IPC) or national classification and IPC IPC: **G01N 33/53**(2006.01) USPC: 435/7.1		
Applicant SCIENCE & TECHNOLOGY CORPORATION @ UNM		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of — sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
11 February 2004 (11.02.2004)	25 May 2006 (25.05.2006)
Name and mailing address of the IPEA/US Mail Stop PCT, Attn: IPEA/ US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer MINH TAM DAVIS J. Roberts for Telephone No. 571-272-1600

Form PCT/IPEA/409 (cover sheet)(July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/21306

I. Basis of the report

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed.

☒ the description:
pages 1-33 as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☒ the claims:
pages 34-38, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☒ the drawings:
pages 1, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

☐ the sequence listing part of the description:
pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination(under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages NONE

☐ the claims, Nos. NONE

☐ the drawings, sheets/~~fig~~ NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/US03/21306

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

Novelty (N)	Claims 1-45	YES
	Claims NONE	NO
Inventive Step (IS)	Claims NONE	YES
	Claims 1-45	NO
Industrial Applicability (IA)	Claims 1-45	YES
	Claims NONE	NO

2. CITATIONS AND EXPLANATIONS

Claims 1-45 lack an inventive step under PCT Article 33(3) as being obvious over Elliot et al in view of Cole et al.

It is noted that ITA, or invasive trophoblast antigen, is also known as hyperglycosylated human chorionic gonadotropin (hCG) (specification, p.5, lines 4-5).

Elliott et al teach that in hydatidiform mole and choriocarcinoma, both alpha and beta subunits of hCG in urine sample show increased hyperglycosylation as compared to normal pregnancy (abstract). Elliott et al further teach that in choriocarcinoma, the alpha subunit of hCG exhibits increased total glycosylation to 29.4% (p.22, second column, first paragraph), whereas a change in structure to an increased proportion of hyperglycosylated, non-predominating N- and O-linked structure is found in beta-subunit as compared to normal and diabetic pregnancy (abstract, second column, and p.22, second column, last paragraph).

Cole et al teach that in trophoblastic diseases such as hydatidiform mole, gestational choriocarcinoma, testicular choriocarcinoma, and placental site trophoblastic disease, hyperglycosylated hCG, nicked hCG, and free beta-subunit may be the principal source of hCG immunoreactivity in serum (p.309, first column, second paragraph). Cole et al further teach that <2 IU/L is considered at the limit of detection (table 5 and its legend on page 313), and in false-positive cases, all 12 women lack measurable (>2IU/L) of true hCG or its breakdown products(p.309, second column, last paragraph and table 5 on page 313).

It would have been obvious to detect trophoblastic diseases such as hydatidiform mole, gestational choriocarcinoma, testicular choriocarcinoma, and placental site trophoblastic disease, as taught by Cole et al, by detecting an increase in hyperglycosylated human chorionic gonadotropin, as taught by Elliott et al, or Cole et al, because in hydatidiform mole and choriocarcinoma, both alpha and beta subunits of hCG exhibit increased hyperglycosylation, as taught by Elliott et al, and because in trophoblastic diseases, hyperglycosylated hCG may be the principal source of immunoreactivity in serum, as taught by Cole et al.

It would have been obvious to determine that invasive trophoblast cells or trophoblastic diseases, such as hydatidiform mole, gestational choriocarcinoma, testicular choriocarcinoma, and placental site trophoblastic disease, are present when the percentage of hyperglycosylated hCG of the total hCG is 30% or greater, or when the amount of hyperglycosylated in a sample is 2 IU/L or greater, because in choriocarcinoma, the alpha subunit of hCG exhibits increased total glycosylation to 29.4%, as taught by Elliott et al, and because <2 IU/L is considered at the limit of detection, and in false-positive cases, all 12 women lack measurable (>2IU/L) of true hCG or its breakdown products, as taught by Cole et al.

Similarly, it would have been obvious to determine that quiescent gestational trophoblastic disease is present when the patient has low hCG titers and when the percentage of hyperglycosylated hCG is less than 30%, because quiescent gestational trophoblastic disease precedes and could develop into invasive trophoblastic diseases, and because invasive trophoblastic diseases is detected only when said percentage of hyperglycosylated hCG is 30% or more.

It would have been obvious to use either serum or urine as a sample for detecting hCG, because hCG could be isolated from or detected in serum, as taught by Cole et al, or in urine, as taught by Elliott et al.

Claims 1-45 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

PATENT COOPERATION TREATY

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NOTE OF INFORMAL COMMUNICATION WITH THE APPLICANT

(PCT Rule 66.6)

International application No.	Applicant's or agent's file reference	Date of informal communication *(day/month/year)*
PCT/US03/21306	NI2-003PCT	11 May 2006 (11.05.2006)

Applicant
SCIENCE & TECHNOLOGY CORPORATION @ UNM

Communication

☒ by telephone

☐ personal

Participants

☐ Identity checked ☒ authorization checked ☐ personally known

☒ Applicant: SCIENCE & TECHNOLOGY CORPORATION @ UNM

☒ Agent: HENRY COLEMAN

☒ Examiner(s): MINH TAM DAVIS

Summary of communication:

Applicant will accept 409.

☐ ~~An extension of time limit is granted (Form PCT/IPEA/427.~~

☒ A copy of this note is being sent to the applicant with Form ~~PCT/IPEA/429.~~ PCT/IPEA/416 & 409.

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